

# A Primer on Postoccupancy Evaluation

*Uses and techniques of an increasingly valued tool. By Craig M. Zimring and Janet E. Reizenstein*

The idea that buildings should accommodate the needs of the people who use them is not a new one in architecture. What is relatively new, and increasingly accepted, is the practice of using systematic methods to find out exactly what makes designed environments work well for their users. Interviews, surveys, observations and other methods are being used to explore users' responses to a wide range of buildings. The practice is known as postoccupancy evaluation (POE).

Postoccupancy evaluations, as they have evolved to date, focus primarily on the impacts of designs on users. This is not to imply that evaluations of other aspects of design are not critically important: esthetics, energy performance, maintenance and the workings of structural, electrical and mechanical systems. Some evaluations take a multidisciplinary approach. However, the ways buildings work for people are less well understood than some of the other aspects and need special attention.

Postoccupancy evaluations have two major purposes: immediate feedback for a given project and development of information for future designs. POEs give feedback to designers, managers and users about how designs function in relation to users' needs and suggest how buildings might be improved.

Without systematic behavioral evaluation, designers must rely primarily on occasional comments from the client to know if the design "worked." Certain kinds of feedback may get back to them in the form of recognition by fellow designers (publication or awards) or problem reports, but evaluations offer a way to ensure that the architect receives feedback from users, as well as clients, identifying how some design features work well and others work less well.

POEs also contribute to the body of knowledge architects have about the social impacts of design. As design sociologist John Zeisel has pointed out, evaluations can make the design process cyclical so that the predesign programming for each new project benefits from knowledge of previous related projects. The alternative approach is a linear one—each project starting from scratch, without benefit of systematic learning.

Interest and activity in the field of postoccupancy evaluations are growing rapidly. One of the world's largest building clients, the U.S. General Services Administration, has routinely performed comprehensive postoccupancy evaluations since 1976. These evaluations use teams that include a senior architect, mechanical engineer, electrical engineer and psychologist and focus on a broad range of issues, including behavior, energy and cost effectiveness. According to team psychologist Ron Reinsel, one of the most significant outcomes of this process has been a change in the way GSA deals with architects. Because the evaluations also examine the programming process and compare the program to the completed building, the evaluations have helped GSA develop a more straightforward programming process, one with which both architects and client are more pleased.

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**Mr. Zimring** is an environmental psychologist on the faculty of the college of architecture, Georgia Institute of Technology, is coauthor of *Environmental Design Evaluation* and has performed postoccupancy evaluations for government and private clients. **Ms. Reizenstein** is an environmental sociologist working on the design of the University of Michigan Replacement Hospital. She is a board member of the Environmental Design Research Association and an associate editor of *Environment & Behavior*.

An increasing number of private clients, and architects themselves, are commissioning or conducting POEs, and they are getting growing recognition in the literature of the profession. This magazine's evaluation series has many of the characteristics of POEs, and several POEs have won *Progressive Architecture* applied research awards. The journal *Environment and Behavior* recently devoted an entire issue to POEs and seeks examples for publication on a regular basis. A recommendation for wider use of evaluations even appeared in the ill-fated Moynihan bill attempting to change the charter of the U.S. public buildings service.

**T**he reason for the increasing acceptance of POEs is simple: With better information about how some of the many assumptions and decisions made during the design process actually turn out, designers are finding they can produce better designs. However, there are other reasons why designers are using evaluations. It is exciting to find out how your design works, to see that your intuition was dead-on or that the extra care that was put into the design made users pleased and enthusiastic.

Postoccupancy evaluations can be understood more clearly if we compare them to something familiar: architectural criticism. In some ways POEs and criticism are very similar, in other ways very different. Both evaluations and criticism look at the historical context of a building and try to place it in the history of architecture. Both look at circumstances leading to the building being built the way it was, and may look at similar issues such as circulation, image or appropriateness for the local context. There are, however, some fundamental differences between criticism and POEs. Neither is inherently "good" or "bad," though there are good and bad examples of each. They come from different traditions and serve different purposes. Criticism is by its nature subjective; it is the building seen from the critic's viewpoint. Evaluations use systematic methods of investigation to gain a valid picture of the users' views of the building.

Traditional architectural criticism has, as its main focus, esthetics—the quality of the design and its place in the history of artistic ideas and concepts. POEs consider esthetics as one of many design elements affecting users.

A fundamental difference between criticism and evaluations is the process by which conclusions are reached. The critic may visit the site, examine photographs and/or look at other buildings by the same designer; the methods depend on the individual approach of the critic. The results of this examination may yield artistically valid insights about the work itself, describe a historical milieu in which the design was conceived and identify significant flaws in the execution. By contrast POEs use relatively standard and tested procedures of investigation to ensure that the information is not biased.

In *Environmental Design Evaluation* (Plenum, 1978), Arnold Friedmann, Craig Zimring and Ervin Zube describe a multistep process for doing an evaluation. They suggest that the problem must first be described in terms of five elements: the users, the building itself, the social-historical context, the design process and the neighborhood. They stress that the users are not merely the people who work or live in the setting; they may be passersby or other people affected by the building. A description of the building includes such typical architectural considerations as

size, cost and materials as well as a description of other qualities important to users—for instance, the amount of auditory and visual privacy provided. The social-historical context is a description of the broad forces that influenced the building design. Examples are societal pressures to create an energy-efficient structure or the increasing demand for housing for the elderly. This description is closely tied to the design process. POEs generally describe who made decisions and help understand the various participants' roles in creating the final design (client, users, designers, bankers, etc.). Finally, POEs consider the neighborhood, focusing on how well the building fits in its physical context and on how the building is affected by its surroundings. The neighborhood is examined from an esthetic viewpoint to assess the fit between building and surroundings as well as from a social viewpoint: how the building affects neighborhood pride and self-image.

Once the five elements of a postoccupancy evaluation are described, the evaluators define and give priority to issues the client, users, designers and they (the evaluators) are interested in. These could include: lighting, color, use of space and privacy. The chosen issues serve as the focus of the evaluation.

Next, the evaluators select and refine techniques to gather information. The test of effective data-gathering techniques is whether they provide good quality information at a reasonable cost. In evaluations, "good quality" means that the methods are sensitive enough to capture important problems, and that they provide a valid and reliable picture of the users' reactions—not the views of the evaluator. In addition, the research must be structured so that it can be generalized appropriately; if the POE is intended to provide input into a subsequent design, then it must study issues common to both design projects.

After the data-gathering techniques are refined and pretested, these must be used in a way that does not bias the results: Interviewers must not ask leading questions or only pick people who will give positive responses, and so on.

Finally, after data have been collected and processed, they must be analyzed, a step that represents another difference between criticism and POEs. Criticism seldom uses numerical or statistical analysis, but rather relies on personal and historical frameworks for understanding a designed environment. A POE generally combines quantitative analyses of data (such as survey responses or counts of where people spend their time) with qualitative analyses of interviews and photographs to arrive at a picture of user attitudes and behaviors.

Talking to many designers and performing a number of POEs ourselves has revealed some common themes about the benefits architects are deriving from them. These benefits can be grouped into three general categories: ways evaluations have provided information to aid creativity and design development, ways they have enhanced and clarified programming and ways they have lengthened and solidified the designer-client relationship.

John Gibson, AIA, of Bohlen, Meyer, Gibson in Indianapolis has pointed out that one effect of information is to foster design creativity: "The more information you have, the more creative you can be. If you're lacking information, you tend to zero in on one to two aspects of the project, but these may be the wrong things to emphasize."

The output of POEs can be design guidelines of varying degrees of specificity for various building elements or types, or it can be performance criteria, which state a desired end result but do not specify design solutions. Evaluations can also yield organizing concepts that help to focus creativity in designs. One such principle that has served as a central theme in design of publicly assisted housing is that of the residents' control over their physical environment.

Not all POEs are devoted to testing overall concepts or at producing general guidelines. Many focus on assessing the adequacy of particular design elements such as signage or lighting. These studies may be very useful in helping to fine-tune the

building to correct problems; a client may be very pleased if the designer comes back to modify the signage or alter the lighting system. However, narrowly focused studies may not be as easily applied to new projects as are conceptually focused studies. The requirements for materials and design of every building are unique; specific results may not apply to a new design as well as can more general concepts.

POEs can be used to evaluate the program as well as the design. Frequently they will trace a malfunction of a building back to a false assumption in the programming process.

Evaluations have also helped convince clients to adopt design alternatives they might not have otherwise considered. For example, Ewing Miller, FAIA, senior partner in Archonics Design Partnership, Indianapolis, was asked to design new dormitories at Indiana State University, which, like many other universities, had been building highrise dorms. Armed with evaluations showing that students preferred lowrises, Miller and his associates convinced the university to build three-and-four-story walk-up apartments. Miller recalls, "The research findings turned around the dean of students and the governing board." He notes, with satisfaction, that "although several years later they could not fill the highrise dorms, and these had to be converted to other uses, the walk-up apartments have always been popular."

POEs may also help establish the cause of design or function problems. When Hugh Stubbins & Associates of Cambridge, Mass., designed a headquarters building for a large U.S. corporation, the building was generally well received, but there were many complaints about temperature control. An evaluation helped pinpoint the source of the problem: poor installation of the HVAC system. This was corrected, and a major irritant was removed—one that had been blamed on the architects by many of the users.

**T**his points up the special benefits that can accrue from evaluating buildings more than once, over time, or even on a continuing basis. Doing so can keep designers and managers informed about the fit between the building and the users throughout its life, and identify not just problems, but the need to change it to meet changing circumstances.

POEs can also help extend and enhance the client-designer relationship. Charles Albanese, AIA, a partner with Brooks & Associates, Tucson, commissioned a POE in conjunction with the firm's work at the Reid Park Zoo in Tucson. The research team found that exhibits in the central core of the zoo were not being visited. Careful analysis suggested that the circulation system was partially at fault. The visual dominance of the walkways in the outer part of the zoo prevented people from seeing and using the narrower circulation paths in the zoo's central core. In addition, the animals liked to spend the day in the coolest part of their display—a problem, since this was the dry moat surrounding the exhibit and out of the visitors' sight. Says Albanese, "Although it wasn't part of our scope of work, we were interested in why several exhibits weren't working well. The parks and recreation department was apparently impressed by our analysis: They asked us to redesign a number of exhibits, greatly expanding our contract. The client had more confidence in us because of how much we knew about their exhibits from the research and review of the literature, even though we hadn't done zoos before."

Once the decision has been made to conduct a POE, a variety of individuals or groups is available to do the research: The architectural firm may do its own research, the architect or client may hire an individual consultant or professional organization or an academic group may initiate and perform the evaluation. Each of these options has advantages and disadvantages.

Architectural firms that carry out their own evaluations,

although still relatively rare, are quite enthusiastic about the process. The Stubbins firm is an example. It has been conducting POEs since 1976 to "assess buildings' performance as measured against the original programs, acquaint the designer with the opinions and attitudes of the client-user and provide the designer with feedback that can be useful for the design of similar facilities." According to Michael Kraus, AIA, senior associate in the firm, it tries to evaluate all its buildings, but is most likely to evaluate a special or unusual project. Almost 30 have been evaluated to date. Kraus and his colleagues spend up to three days collecting information by talking to users, surveying them or both. The evaluations focus on people who maintain, operate and use the buildings. Findings are disseminated in-house and usually to the client.

Another architectural firm conducting POEs is CRS, Houston, which routinely includes them as part of its standard services. It has a highly interactive design process, one that involves users during predesign, design and evaluation. Depending on the situation, CRS may use interviews, questionnaires or both in doing POEs. It finds that the session when it provides evaluation results to the users is particularly exciting and helpful to architects and users alike.

**A**rchitects who want to collect information about how buildings work for people need to carefully consider a number of issues. First, the ultimate goal of a POE is to provide useful, high quality information. Although the professional and personal judgments of the evaluator may enrich an evaluation, they must be clearly separated from a factual view of users' reactions to the building. Several issues affect the quality of the information: The people who are chosen to be observed or interviewed must be representative of the actual users of the building, they should be chosen in a way that allows all viewpoints to be represented (such as by choosing every tenth person in the corporate phone directory) and there must be enough people involved to get a fair view of users' reactions. This last may require scores or hundreds of people, depending on the situation.

Techniques need to be chosen that accurately assess the important issues in an evaluation. Because any single data-gathering technique has limitations, evaluators usually select several to balance the strengths and weaknesses of each one. Some techniques commonly used in POEs include: observation, in which users' activities are recorded directly on a floor plan of the setting or with some other recording scheme; interviews with tenants, managers, workers, or passersby; photographic survey; analysis of documents, such as correspondence between the client and designer, or sales records of retail properties and looking at physical evidence of use. Evaluation methods are described more fully in a new book, *Inquiry by Design*, by John Zeisel (Brooks/Cole, 1981).

In addition to the procedural issues to consider when conducting their own POEs, there are other potential concerns when architectural firms undertake research of this sort, one being the vested interest a firm may have in evaluating its own design. Even the well-intentioned architect/researcher will have specific expectations about his or her own design and this bias may unconsciously affect the evaluation. In addition, many firms simply don't have the money to support services beyond those paid for directly by the client, even if these improve the firm's overall designs. One alternative is to convince the client to pay for evaluations (using AIA documents B-161 and B-162). Although still rare, this is becoming more frequent as evaluations are better accepted. Another alternative is to hire architects with research training. A few schools of architecture, including Georgia Tech and the University of Wisconsin-Milwaukee, offer concentrations in environment-behavior research. Graduates of these programs are likely to have a working knowledge

of the literature and methodologies of postoccupancy evaluation.

Rather than doing an evaluation itself, the design firm may wish to hire a consultant. The advantages over in-house evaluations are that good consultants will have been trained specifically in evaluations and know appropriate data-gathering techniques and data analysis and interpretation procedures. Consultants are also likely to be aware of other evaluations of the given building type. And, because they aren't evaluating their own design, less bias is likely to result.

However, some problems may occur when working with a consultant. It is sometimes difficult for the designer to express to a consultant exactly what information is needed. Traditionally, researchers have been trained to be oriented to the written word, rather than to the visual mode familiar to architects. And many researchers come from a background where time schedules are different from those used in architectural practice. One solution to these problems is to seek out consultants experienced in working with designers. As evaluations become more common, an increasing number of consultants is becoming knowledgeable about the time and money constraints of design firms—and more and more consultants speak the designers' language.

Several organizations have members experienced in design evaluation. The Environmental Design Research Association based in Washington, D.C., has more than 900 members, including designers, researchers and clients. Some of these researchers are in academia, some are fulltime consultants and many do teaching, research and consulting. The Architectural Research Centers Consortium is an organization of schools of architecture with research programs. It also can direct designers to experienced evaluators.

Clients also may commission POEs, and from the designer's standpoint, there are some clear advantages when the client does so. Clients generally have greater resources than design firms, so evaluations may be more detailed. Also, if the evaluation results in innovative but costly suggestions, the client may be more willing to accept them if it paid for the evaluation. For example, an evaluation of pretrial detention centers (described on page 57) discovered that the motel-like furnishings were well-received, but that more recreation space was needed. As a result, the bureau of prisons, which commissioned the evaluation, is considering enhancing rooftop recreation facilities at future centers.

**M**ost evaluations haven't been initiated by the designer in private practice. Rather, they have been initiated and performed by an academic group and carried out for a variety of reasons: interest in a particular building or building type, interest in a particular psychological or social process such as crowding, interest in developing evaluation methods or simply as a class exercise.

From the perspective of the architect in practice, academic-initiated research has both advantages and problems. It is advantageous because university professors may volunteer their time and because many are competent in performing evaluations: They use rigorous methodology and are knowledgeable about related research. From the designer's viewpoint, a disadvantage may be the fact that many academic evaluations use technical language and specialized concepts intended for the evaluator's peers rather than for the practitioner.

POEs not only benefit their sponsors or those involved with the buildings under study, they contribute to a rich and growing storehouse of information on the social impacts of design. Architects can mine this information and come up with better designs—with designs that respond to user needs in addition to the myriad of other factors involved in any building project.

On the following pages are examples of POEs on some prominent, and not so prominent, buildings—summarizing the techniques used and the lessons learned.

# Postoccupancy Evaluation: A Set of Six Case Histories

1. Since the 1930s growing numbers of Americans have been accommodated in subsidized housing, and, although many experts have attacked its effectiveness, it has only been recently that evaluators have begun to ask residents how *they* feel. Between 1972 and 1977, Guido Francescato, Sue Weidemann, James Anderson and Richard Chenoweth studied residents' satisfaction with HUD-assisted housing at 37 sites primarily in the East, Midwest and Southeast.

The housing developments ranged in size from 44 units to 1,124 units and most were clusters of lowrise buildings, although some midrise and highrise developments were included. The developments ranged in age from new buildings to those 30 years old or more, and represented a considerable variety of architectural quality, from unadorned boxes on asphalt parking lots to pleasant and well-designed projects on carefully landscaped sites.

The evaluators used several data-gathering techniques to assess the relationship of housing design to resident satisfaction with the housing projects. At each site they sent out questionnaires to residents, with a total of 1,907 being returned; recorded how and where residents spent their time over a two-day period; analyzed the management records to ascertain the background of the residents; photographed the sites and buildings, and examined the architectural drawings and other documents related to each project.

The research found that "a blend of factors is responsible for creating a satisfactory living environment, not a single aspect." The researchers identified a number of factors that contributed to satisfaction, such as user control over the physical environment, privacy, maintenance and satisfaction with management. However, the three best predictors of resident satisfaction with their living environment were satisfaction with other residents, perceived economic value of living in the housing development and pleasant appearance.

The developments that were rated highest on appearance represented a range of styles: traditional and contemporary, lowrise and highrise. Developments that looked institutional in their fenestration, facades and entrances were rated low; developments that had individualized forms and looked cared-for were highly rated. Contrary to some commonly held views, highrise housing, when appropriately designed and managed, was

not inherently unsatisfactory and was actually rated higher than lowrise housing on privacy and security. Overall, as one resident said of his development: "I'd rather live in a single-family house, but this place is pretty nice."

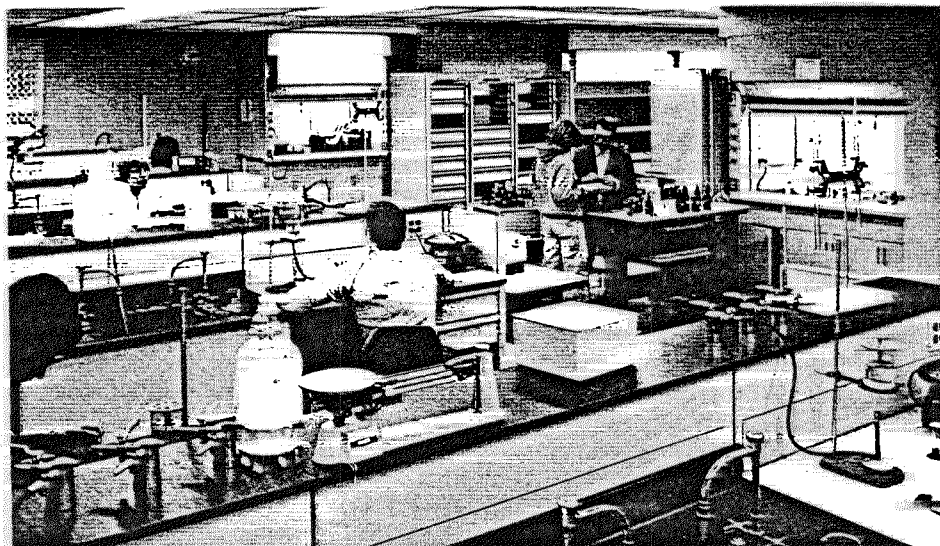
## 2. Modular Laboratories For Instructional Use

Can the design and management of a college building affect the quality of the education that goes on inside it? Kellogg Community College thought so. The college commissioned Facility Management Institute (a division of Herman Miller Research) to design interiors for a 60,000-square-foot, four-story science/health technologies building on their Battle Creek, Mich., campus. The evaluation of the completed building, designed by Sarvis Associates and opened in 1980, was conducted during 18 months using objectives set out in the building's original concept documents. These objectives included adaptable space configurations, more efficient use of faculty time and improved student interest.

The evaluators held open-ended interviews with instructors, students and administrators, observed and recorded lab activities for four weeks, monitored spatial behavior and analyzed enrollment and other records.

Plagued by existing science buildings that were overcrowded, obsolete and full of huge quantities of uninventoried sup-

*Lab materials are delivered daily to students in individual trays (above). Instructor has desk in lab itself (below).*



Photographs courtesy of the Facility Management Institute



plies, the college wanted a building that would be able to adjust as curricula and enrollments change. The new building incorporated modular laboratory and office furnishings, mixing all functions (classrooms, labs, study areas, project rooms, offices) in the same expanse of open interior space. Spatial and acoustic separation of functions was maximized, but different kinds of spaces could be expanded, moved or removed in hours or days. So far, there have been scores of minor changes and several major changes, including an enlargement of a dozen faculty offices and two classrooms. Numerous superfluous features such as extra storage units have been moved.

"Coming from a conventional setting, we couldn't imagine much more than translating what we already had into new furniture," says one user. "We had to live here before we saw the possibilities. I think we're now entering the period when the flexibility is going to start paying off." The evaluators found evidence to support this. After an initial flurry of rearrangements, followed by a quiet period, the change rate is climbing. A reception area, for example, has been put to use as an

audiovisual materials center.

College administrators wanted a building whose materials were so well organized and managed that both faculty and students would have more time to interact. Previously it was not uncommon to spend a quarter of an hour rummaging through drawers and cabinets at the beginning of lab periods, and labs often ran late because of this. The new building uses a materials management department modeled on hospital systems to deliver materials to the labs each day. A work sampling evaluation showed that the amount of interaction between students and instructors doubled in the new building. This was partly because of the materials management system but also, unexpectedly, because instructors became able to spend more time in the labs. A mobile "office" table in the lab areas allows them to do work and class preparation in the labs instead of elsewhere.

The administrators also hoped that a modern, elegant building for science courses, replacing outdated buildings, would improve student interest. Evaluators followed enrollment figures, number of science majors, science books withdrawn from the library and numbers of students finishing science courses. All these indicators rose after occupancy. The new building looks "newer than the labs I'll be working in someday," said one student, who added, "I think the snazzy building gives us a credibility edge in the eyes of recruiters." While such reactions are to be expected in most new buildings, the college hopes to keep enrollment figures high by selectively replacing worn furnishing modules.

Evaluations, conducted by the college, are to continue after this year. The college plans to keep watching in-lab activity patterns and to use evaluations to guide reorganizations of flexible environment and materials management systems.

The Facility Management Institute and Kellogg College both have learned lessons about the implementations of innovative systems, one of which is that nothing works quite as predicted. For example, one large lab area is largely unused, due to unexpected scheduling problems. Others, particularly study spaces, are often very heavily used.

Says one of the project designers:

"The flexible furnishings are bailing us out of a few planning oversights such as too small classrooms and too many student project rooms. They're also allowing implementation of things that never occurred to anybody—like the audiovisual control center. We're glad to have the opportunity to follow up on good as well as bad predictions."

*Belchertown school sleeping ward before renovation (right) and after (above right).*

### 3. Renovated Facility For the Retarded

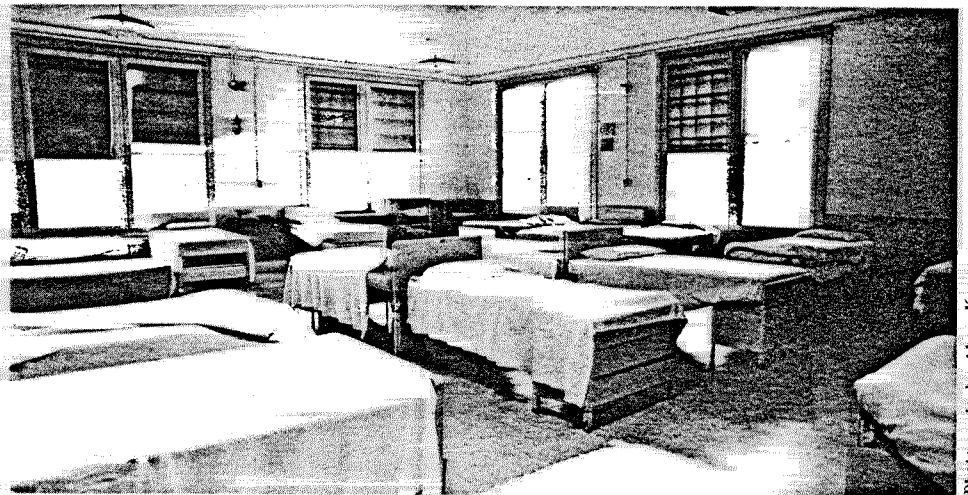
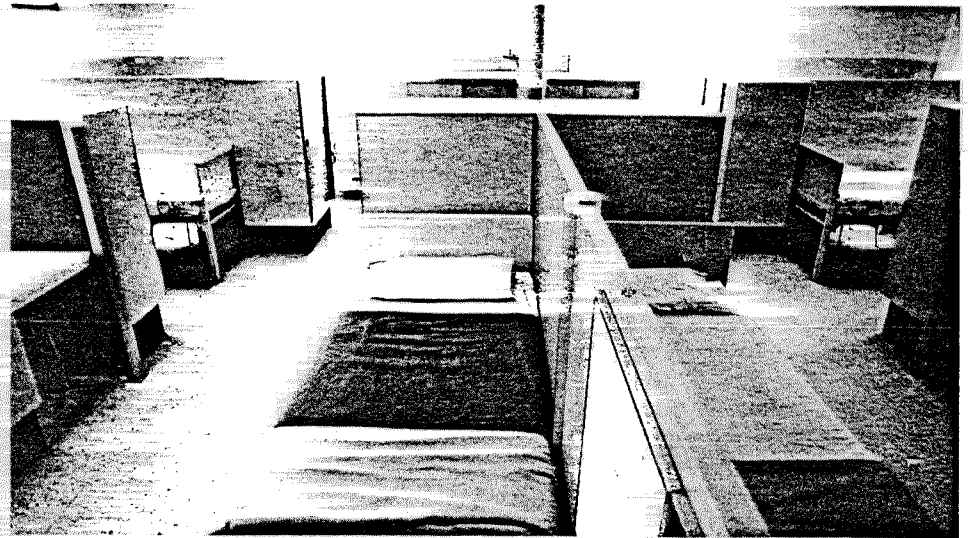
For decades, hundreds of thousands of mentally retarded people have been housed in large state institutions— austere, sparse facilities primarily intended as warehouses for people with mental handicaps. Residents have had little privacy and few amenities; they often sleep in open dorm rooms with 25 to 50 other people. In the last 10 years, increased activism by parents and concern by the federal government have brought reforms; the worst institutions are closing and most others are being renovated to meet federal standards for crowding and safety. Until recently it was unclear whether mentally retarded people prefer to live in single rooms or dorms, or in fact whether people with very low mental abilities respond at all to environmental design.

The Effects of the Living Environment on the Mentally Retarded Project was a three-year postoccupancy evaluation of court-ordered renovations at Belchertown State School in western Massachusetts. At the outset of the evaluation, most of the mentally retarded residents were housed in two-story brick dormitories. Somewhat

resembling college buildings on the outside, the interiors of the buildings were noisy, smelly and sparsely furnished. Each building had six 30x40-foot spaces: Three served as sleeping wards, one was a day hall and two were dining hall/multipurpose rooms.

Because of a class action suit on behalf of the residents, the institution was provided \$2.6 million in state funds to renovate 14 buildings. After hurried design development by Bradley Associates and some conflicts between the administration and the parents' association, the renovations took three forms: a one-and-two person bedroom design, with rooms arranged along a double-loaded corridor resembling a college dormitory in a newer building, and two designs that were placed in the 30x40 spaces in the older dorm buildings. One consisted of shoulder-height modular units, each with a bed, dresser and desk, and the other placed eight-foot-tall sheet-rock partitions in a suite configuration with three- or four-person bedrooms.

The evaluation studied the residents and direct-care staff before and after the renovations, recording where they spent their time and what they did. Data gathering techniques included structured and



Photographs by Alyce Kaprow

unstructured interviews with staff, having a researcher work as a staff member, observing and recording the activities of staff members and residents and measuring sound and acoustics. The observers coded the activities of staff and residents directly onto computer sheets. During the three-year evaluation period, more than 300,000 observations were collected.

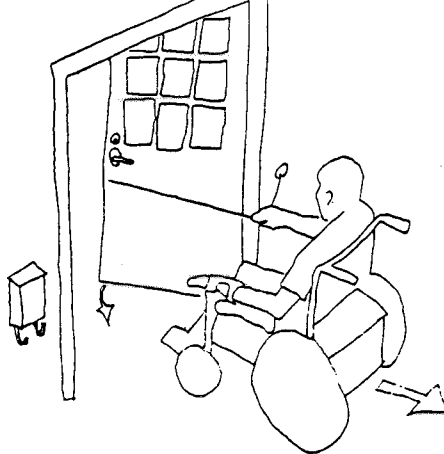
The designers and administrators predicted that all of the design schemes would have some positive impacts on residents and staff and that the suite design would be the most positive because it clustered residents. To their surprise, the double-loaded corridor design was the most positive. While living in this design, residents were more alert and less withdrawn, talked more and fought less. The corridor design was more institutional in appearance than the suite design but had an important advantage: Private and semi-private rooms and the corridor serving only a few people gave the residents control over their lives. They could protect their own space and be alone when they needed to be. Even these residents—who had average IQs of 20—responded to the opportunity to control their lives.

## 4. Apartment Complex For the Disabled

Creative Living, Inc., a small apartment complex for the severely disabled in Columbus, Ohio, was evaluated in 1976, two years after occupancy. The evaluation was part of a project sponsored by the National Endowment for the Arts and four federal agencies (including HUD, the developer of this housing) and managed by the AIA Research Corporation. Two major goals were to learn about designing supportive living environments for severely disabled people and to communicate this information to design professionals, community groups and HUD.

Residents of this complex are quadriplegics: people with paralysis of all four extremities. Quadriplegia, of course, renders individuals physically dependent; most quadriplegics use electric wheelchairs. Less obvious, but perhaps more devastating, can be the resulting psychological dependence. For this reason, this physical environment (and its relation to the total service delivery system of staff, services and environment) was analyzed with regard to the degree to which it enabled residents to accomplish various tasks of daily life without assistance.

Creative Living, Inc., was completed under HUD's section 236 assisted housing program. It provided 10,000 square feet of living space in five double occupancy and 13 single occupancy units. The complex was built in a hollow square plan, facing inward onto a landscaped



courtyard. Each unit contains a living area, kitchen, bedroom and bath.

Three researchers spent four days collecting data. They interviewed, observed and photographed 17 of the 18 residents in their daily activities. Staff, personal service attendants and members of the board of trustees were also interviewed.

One part of the evaluation dealt with design features, describing required physical capabilities, rationale for the particular design decision, analysis of the design as it was used by residents and recommendations for adaptation or change. For example, one design feature evaluated positively was the overhang that covers the entire sidewalk and protects residents in bad weather from exposure that can cause them serious health problems. In contrast, the front doors of the individual apartments were down-rated. Cost limitations prohibited automatic doors, which is unfortunate because most residents can neither operate the locks nor reach the handles to pull the doors closed. Many had ropes or light chains attached to the doors so that they can pull them shut.

## 5. Two Innovative Detention Centers

After it built two innovative jails ("pre-trial detention centers") in New York City and Chicago, the U.S. Bureau of Prisons commissioned postoccupancy evaluations to look at the effectiveness of the buildings in providing secure, humane detention facilities. Three design goals were privacy, noninstitutional design resulting in decreased vandalism and decentralized functional units.

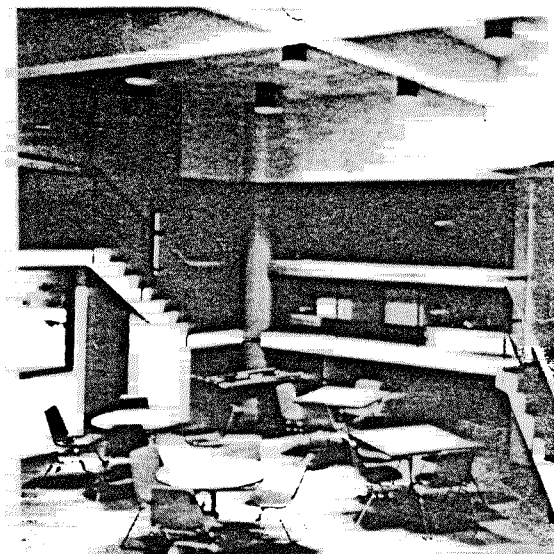
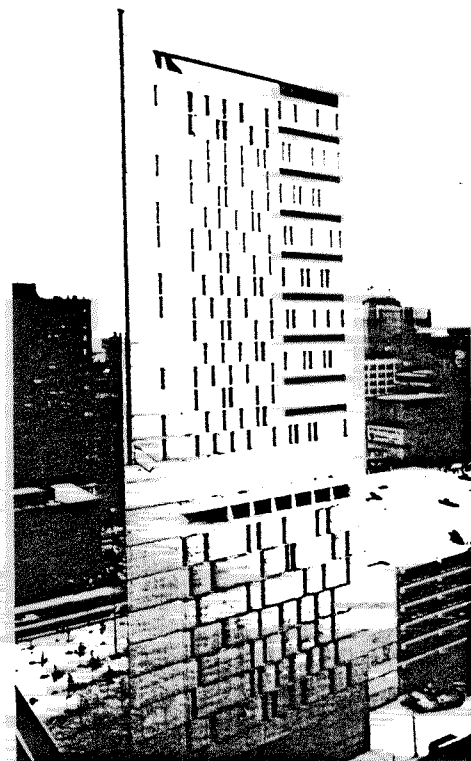
The Chicago Correctional Center by Harry Weese & Partners is a 25-story, triangular building with six functional units. Each basic functional unit has a split-level design, occupying two floors of the building. The central space is a general purpose room containing dining, ping-pong and pool tables and a small kitchenette. Bedrooms surround this space

*Chicago Correctional Center has cells organized around common spaces (right).*

and are located a half-level up or down from it in four triangular wings of 11 rooms each.

The New York correctional center by Gruzen & Partners is an 11-story building with two irregularly shaped units per floor, connected by several sets of doors. Units are split-level, with rooms a half level up or down from a central general purpose space. The general purpose area is 1,800 square feet and contains dining tables, telephone, ping-pong and pool tables and a full kitchen area. Bedrooms are located in six eight-room tiers.

Data came from questionnaires, interviews and observation. In the Chicago facility, 126 inmates and 74 staff members completed questionnaires; in New York, surveys were filled out by 111 inmates and 13 officers. Observations iden-



tified what behavior took place, when and where it occurred and how many people were involved. This resulted in about 12,000 observations in the Chicago facility and 20,000 observations in the New York jail.

Most inmates in single rooms spontaneously mentioned privacy as the best single feature in the environment. However, despite reported satisfaction with privacy, these inmates occasionally did things to increase visual isolation, such as placing paper over window slots of bedroom doors. Inmates in dormitory units were not happy with the amount of privacy they had. They complained that there were no places to escape from the sight of other residents except toilet stalls. In one of the facilities, inmates occasionally hung blankets between bunks in order to gain some privacy.

The research showed that noninstitutional design—including bright colors, windows without bars, the sense of light and air and varied textures—was noticed and appreciated by inmates. Said one, "If the state place was like this, they'd have less problems, 'cause people act better when they're in a nice place." Supporting this view was the low incidence of vandalism and graffiti.

The decentralized functional unit system was intended to provide flexibility for management and to keep needed facilities near inmates. Since this meant that inmates might remain in the unit for days, weeks or months at a time, monotony and boredom were mentioned as problems. As one inmate said, "This place may look nice, but how would you like to be locked in a Holiday Inn for three months?"

## 6. Modern Monument With a Troubled Past

How is it that a building praised by most architects and critics can be greeted with antipathy by many of its users? The turbulent history of the design and 18-year occupancy of Paul Rudolph's Yale Art and Architecture building is being recounted in a forthcoming book by C. Ray Smith, AIA.

Behind the burly facades of vertically ribbed exposed concrete Rudolph provided a complex system of interior spaces. In section, the building centered on a large drafting room stacked over a main hall, around which overlapping platforms and interlocking vertical spaces were arrayed in pinwheel fashion. Many interior walls were finished in exposed concrete, and a good portion of these wore the corduroy pattern of the exterior. The architect sought and achieved a multilevel interior of flowing "spatial experiences," and in doing so set a rather inflexible program for the sculpted spaces.

Smith has interviewed Rudolph extensively and has attempted to talk with everyone who participated in the planning, design, construction and renovation of the building. In addition to Smith's analysis of the design process, the book will include a postoccupancy evaluation survey of all 17 years of alumni. Forty-one percent (approximately 675) of the alumni returned the questionnaire.

The evaluation surveys the building's principal users, art and architecture students, about their reactions to some of the controversial issues surrounding the building, including the 1969 fire that destroyed the three upper floors; the million-dollar rebuilding program on which Rudolph was never consulted, and the medical finding that the exposed asbestos ceilings were carcinogenic, resulting in their replacement.

More specifically, the questionnaire asked alumni about both financial and

esthetic issues. Different functional areas such as drafting, painting and photography spaces were evaluated for such issues as convenience of access to the workplace, lighting, heating, privacy, noise, ceiling height and amount of square footage assigned. A number of esthetic issues were addressed, including spatial atmosphere, spatial variety, esthetics of the structural system, integration of heating system elements and the consistency of the total design.

Says Smith, "No other building has had so dramatic a first 20 years. In contrast to the anticipation of the design of the building as an architectural second coming, for some people who have worked in it, it calls forth such seething rage and vehemence as perhaps no work of architecture before or since." Smith believes that one of the most important lessons to be learned from the history of the Yale building is the difference between how visitors and critics may evaluate design and how it is evaluated by the people who use it every day. □

*The original interior arrangement of the Yale Art and Architecture building.*

